SP9 - User's Manual

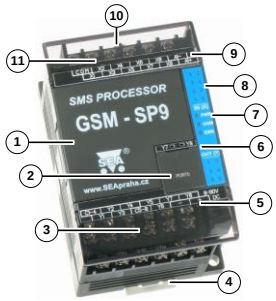
1. Introduction

GSM-SP9 (SP9 for short) is a device for remote monitoring and control via GSM network. There are several variants of SP9 which differ in the number and type of inputs and the presence of internal battery. Number of digital outputs (eight inputs) is the same for all variants. Outputs can change its status or generate an impulse depending on SMS command.
SP9 can react on input changes by sending an SMS and/or by a voice call. Function, input and output names, phone numbers, passwords, etc. are fully user configurable from personal computer either locally via USB cable or remotely via GSM data call (CSD) using modem and program SP Init. This configuration program SP Init can be downloaded (free of charge) from the website www.seapraha.cz (English pages ⇨ Support ⇨ GSM-SP9). The SP9 box has an integrated DIN rail mount, so you can comfortably place SP9 in the cabinet.

Variants of SP9:

- **GSM-SP9-A:** 9 digital inputs, 1 analog input 0 to 20mA and 8 digital outputs
- **GSM-SP9-D:** 11 digital inputs and 8 digital outputs

(1) SIM card holder (located under the cover)
(2) USB connector (under the square cover)
(3) Outputs (Y): 8 outputs (2 x 4)
(4) DIN rail holder
(5) Power supply (8 to 30 V_{DC})
(6) LED outputs indication
(7) LED SP9 status indication
(8) LED inputs indication
(9) Analog input (0 to 20 mA)
(10) GSM antenna connector
(11) Inputs (X): 9 (SP9-A) / 11 (SP9-D)



2. Package

1 pc **GSM-SP9** (see variants)
1 pc GSM antenna (order code GSM-ANT05S)
1 pc USB cable A-B (order code HW-11.02.8818)
1 pc printed documentation (this manual)

Accessories: GSM-SP-BOX-M (has to be ordered separately)

3. Installation

Before inserting the SIM card into the SP9, it is highly recommended to turn off setting of the "PIN code"!
Insert the active SIM card (= at least one call was made) to any mobile telephone and turn off the requirement of setting the PIN. On most mobile telephones, this option can be found in menu "Setting the telephone protection" or "Setup -> Security -> PIN control". Note: The PIN is possible to activate later when the user become familiar with the configuration procedure of SP9.

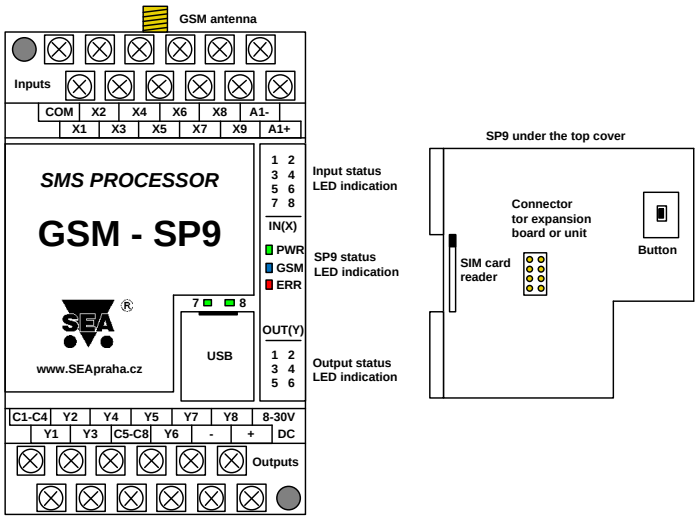
1. Before power on the device SP9 insert an activated SIM card (= call the helpline operator) to the SIM card reader (under the removable cover) and connect GSM antenna. SIM card is inserted into the reader by cut corner down and contacts the center of SP9. Proper insertion can be identified by a mechanical click. SIM card is removed by pressing gently on it (until you hear a click) and release. Now the SIM card can be freely pulled out.
2. Connect the power supply voltage from the DC voltage source 8 to 30 VDC to the terminals + and - power on.
3. If the power supply is OK, the green LED **PWR** lights. At the same time after about 20 seconds will briefly flash red LED **GSM** in the interval 1 for 3 sec.
4. Send SMS text messages from a mobile phone in form 1234 STATE to the phone number of the SP9. The device responds with a status message in the form "Test SP9: Window = Closed elevator Heating system = OK = ON SIGNAL = 53%.". To use other functions it's necessary to configure the device using the program SP Init, see below.
5. Install the SP Init program. The current software version is possible to download (free of charge) at www.seapraha.cz site with GSM-SP9 product. Note: **No USB driver is needed** because SP9 is a HID device type (see Windows ⇨ Control Panel ⇨ System Hardware Device Manager ⇨ Human Interface Devices – if necessary).
6. Run **SP Init** (Windows Start: Programs ⇨ SEA ⇨ SP Init ⇨ SP Init). Connect SP9 to your PC via a USB cable which is included in the package. USB connector (B) is located under the small square cover on SP9 (see the picture). **When configuring SP9 with a USB cable, SP9 must be connected to power!** Load the configuration from SP9 by clicking the **[Load]**. Enter your phone number and rewrite the Paul's name on the "User List".
7. Modified configuration has to be written to SP9. Click the **[Write]**. If you leave the USB cable connected, you can monitor the current state of SP9 inputs, outputs and status.
8. Digital inputs (signals in SP9) are connected to terminals X1 to X9 (or X11) and digital outputs (signals out of the SP9) are connected to terminals Y1 to Y8. Schematics of these signals are listed in the "Hardware" section. In the event of any change on any input SP9 can send to your mobile phone SMS message in the form as "Input1 is closed" (the text depends on SP9 configuration).

4. Technical specifications

Parameter		Symbol	Conditions	MIN.	TYP	MAX	Unit
Dimensions	Width	w			60		mm
	Height (w/o GSM antenna)	h			90		mm
	Depth (between DIN rail and cover)	d			50		mm
Supply	Voltage DC	V_{CC}		8		30	V_{DC}
	Current	I_{CC}	V_{CC} = 12V			0,5	A
	Average power consumption	P_{CC}			2,5		W
Digital inputs DC any polarity	Number	-		9 (SP9-A)		11 (SP9-D)	-
	Voltage log. H	$\|V_{IN}\|$		8	12	30	V
	Voltage log. L	$\|V_{IN}\|$			<4	4	V
	Current	I_{IN}	V_{IN} = 12V		5		mA
Digital outputs DC, AC	Number	-			8		-
	Voltage DC	V_{OUTDC}				50	V_{DC}
	Voltage AC	V_{OUTAC}				35	V_{AC}
	Current DC	I_{OUTDC}				100	mA
	Current AC	I_{OUTAC}				70	mA
Analog input (SP9-A only)	Number	-			1		-
	Measured value	-	Current or user selectable conversion				-
	Measured current	-		0		20	mA
	Input resistance	R_{IN}	Current input		100		Ω
	Resolution	-			12		bits
GSM module	Band		800/1800 MHz (800/900/1800/1900 MHz on special order)				-
Temperature	Operational	t_A		-20		+45	°C
Humidity	Operational	h_R				90	%

SP9 is designed to be used inside a building only! For outdoor use you need accessories SP9 BOX!

5. Hardware

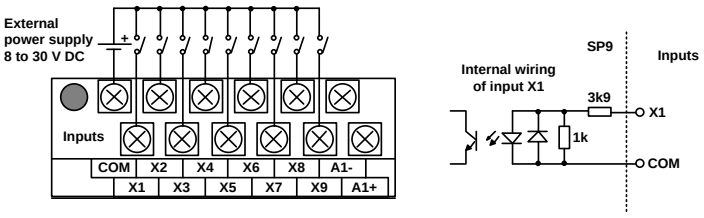


Warning

It's highly recommended to use extra power supply for SP9 power, galvanically separated from power supply for input and output external circuitry, especially when I/O have long wires, that may be noisy.

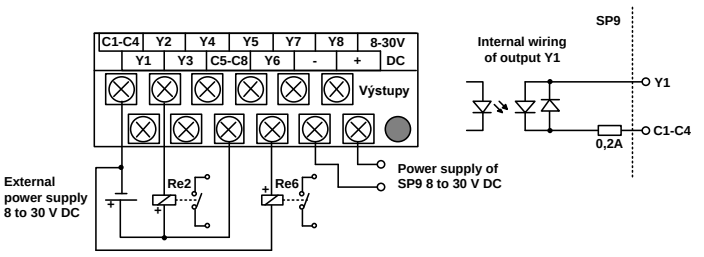
5.1 Digital inputs (X)

Digital inputs (SP9 input signals) are connected to the input terminal where the COM terminal is common for all digital inputs X1 to X9 (or X11). The figure shows an example of the connection of external circuits, and internal wiring of input X1 (same for all digital inputs). The polarity does not matter - COM can be plus or minus.



5.2 Digital outputs (Y)

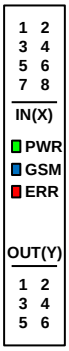
Digital outputs (SP9 output signals) are connected to the output terminal where the terminal C1-C4 is common for outputs Y1 to Y4 and the terminal C5-C8 is common for Y5 to Y8. The figure shows an example of the external and internal wiring circuits of output Y1 (the same for all digital outputs). Y2 output switches negative branch power relay coil and vice versa Re2 Y6 output switching power supply positive branch of the relay coil Re6 (voltage relay must correspond to an external source voltage!). The polarity of the terminals C1-C4 and C5-C8 terminals is irrelevant can be plus or minus.



5.3 Analog Input (SP9-A only)

SP9-A version has 1 analog input, which is connected to the input terminals (AI+, AI-). This analog input is designed to measure the current 0-20 mA. The measured value 0-20 mA can be converted to user units. For example the measured current from 4 to 20 mA can be displayed as the pressure of 0-5 MPa (see the chapter Configuration - program SP Init).

5.4 Front Panel



The front panel of the SP9 includes **SP9 status LEDs** and **inputs and outputs status LEDs**. The state is only shown for inputs X1 to X8 and all outputs Y1 to Y8 (LED for Y7 and Y8 are located above the USB connector).

Under the removable cover is placed **SIM card reader**, the button (intended for future use) and a connector for connecting of expansion board or unit.

SIM card is inserted into the reader (cut corner down) and contacts to center of SP9. Proper insertion can be identified by a mechanical click. SIM card can be removed by pressing gently on it (until a click) and release. Then the SIM card can be pulled out.

USB connector for PC connection is hidden under the square cover.

LED	COLOR	Meaning			
		Dark	Light	Blink 1x per 3sec	Blink Fast 1:1
PWR	green	Power OFF	Power ON or battery powered	-	-
GSM	blue	no GSM signal	other GSM error	GSM OK: normal operation	SIM card problem
ERR	red	SP9 OK: normal operation	Error	Error	Error
1 to 8 (IN)	green	input not activated	input is activated	-	during transition time before input status is accepted after input change (before SMS can be sent)
1 to 8 (OUT)	green	output not activated	output is activated	-	-

6. Remote Control

6.1 SMS Message control

SP9 is controlled via SMS messages of GSM network. Command SMS messages are in form:
<PASSWORD> <COMMAND> [<RETURN COMMAND >]
Example:
1234 STATE … SP9 returns an SMS containing status
1234 DOUT1 ON … SP9 output1 will be switched on. Confirmation SMS will be returned
1234 DOUT8 PULSE NOBACK … SP9 pulse on output8 will be generated, no confirmation message will be sent back
It's possible to write more commands into one command SMS. For higher readability separate commands by semicolon ";" inside command use "=".
1234 OUTPUT0=ON; OUTPUT1=ON; OUTPUT3=PULSE;
Names of inputs and outputs are user definable by SPInit program. Command SMS may look like this:
1234 GATE=OPEN; HEATING=ON; LAMP=BLINK

6.2 Status SMS Text Message

Whenever command SMS contains valid password, SP9 always returns status SMS. Status SMS contains following information:
<Device Name>: <LogInput1>=<LogInput1Status> <LogInput2>=<LogInput2Status> ... <LogOutput1>=<LogOutput1Status> <LogOutput2>=<LogOutput1Status> ... <GSM Signal Level>
Status SMS message contains information only about selected inputs and outputs. Selection is done in configuration program SPInit by checking the appropriate checkbox.

SP9 Status SMS Example	Explanation
Device SP9:	Device Name (user configurable)
DIn1=on	Digital Input 1 is on
DIn2=off	Digital Input 2 is off
DOut3=on	Digital Output 3 is on (closed)
Signal=58%	GSM Signal level in %

7. Configuration

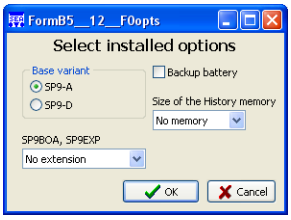
7.1 SP Init – Configuration Software

For configuration of SP9 is used special program call **SP Init**. This program can be downloaded free of charge from the website ..... www.seapraha.cz GSM-SP9.

Program **SP Init** enables:

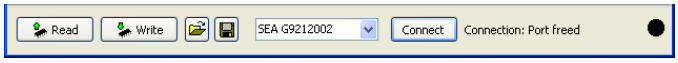
- Local configuration of SP9 from PC via USB cable
- Local monitoring of SP9 from PC via USB cable
- Remote configuration of SP9 from PC via GSM network (CSD)
- Remote monitoring of SP9 from PC via GSM network (CSD)

Note: **No USB driver is needed** because SP9 is a HID device type. See Windows ⇨ the Control Panel ⇨ System Hardware Device Manager ⇨ Human Interface Devices - if necessary.



After installation (during the first run) of the configuration program SP Init it is necessary to select the device variant (SP9-A or SP9-D), the presence of a backup battery and/or memory size. Select expansion board SP9BOA or expansion unit SP9EXP (if connected) or "No extension".

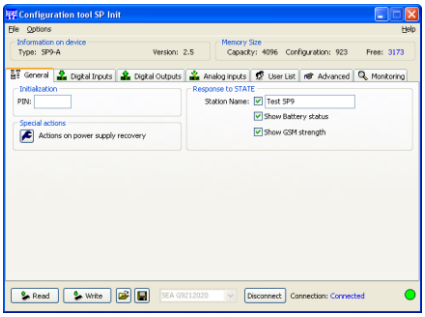
After connecting the USB cable to SP9 the proper COM port is selected automatically (**SP9 has to be powered!**). After pressing the [Connect] SP9 establishes communication with the PC (see the "Connection: Connected"). Now it is possible to read, change and write configuration to SP9 or read it or write to a file on PC.



7.2 SPInit - Tab "General"

In the "General" tab you can set up the PIN for the SIM card, station name, event after turning on the device and internal inputs.

7.2.1 Initialization



Enter 4 to 8 digit *PIN* code of the SIM card which is inserted in the SP9 device. (Leave the PIN field empty if usage of the PIN code on the SIM card is disabled).

7.2.2 Response to STATE

The *Station Name* identifies the SP9 device. This text is placed at the beginning of every sent SMS message. It's also possible add items *Show Battery status* and *Show GSM strength* to status SMS by checking these items.

7.2.3 Special actions

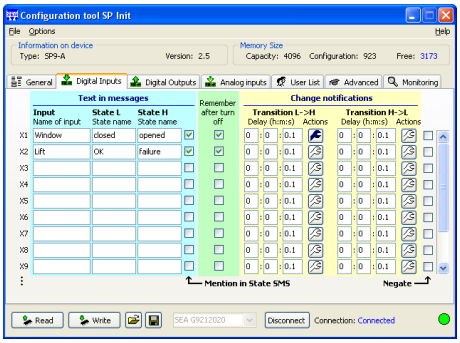
Use button *Actions on power supply recovery* to specify the text of SMS messages or voice calls which the SP9 device sends on startup (see chapter Inputs Events).

7.3 SPInit - Tab "Digital Inputs"

On this tab, you can set configuration of all digital inputs of SP9 device. (These inputs have only two states: YES – NO).

These texts will appear in the status SMS.

Note: Inputs DIn10 and DIn11 are not available for the SP9-A.



7.3.1 Text in Messages

Input Name, State L, State H

These fields contain names of inputs and their possible states, which are listed in the status SMS message.

Example:
When we assign *Input* as "Input1", "*State L*" as Off and "*State H*" as On, the part of SMS status message concerning Input1 will look like this "`Input1=On`".

Mention in State SMS

If this box is checked, the status of this input will appear in the status SMS message.

Remember after turn off

If this box is checked, the digital input state before switching off of the SP9 will be remembered. This is important when SP9 has to send an SMS message (or make voice calls) and the input state changes during a power on of SP9. Details are provided in analog inputs.

7.3.2 Change Notification

Transition L => H, transition H => L

When the input level is changed than after delay (which is necessary for the recognition of the input state) the requested action (SMS or voice call) is performed.

Delay (h: m: s)

Specifies how long new input state must be stable before action is executed.
(Note: the delay timers are nonlinear and it may happen that the program adjusts your choice at the earliest possible time, e.g. 25:0:5 is adjusted to 25:0:0).

Actions

Here is possible to select what SMS messages or calls the device has to send when the status changes (see "Events at the inputs").

Actions (SMS or voice calls) to be done on the transition of input signal. (See the chapter "Inputs Events").

Negate
If this box is checked, the meaning of states L (inactive) and H (active) is opposite.

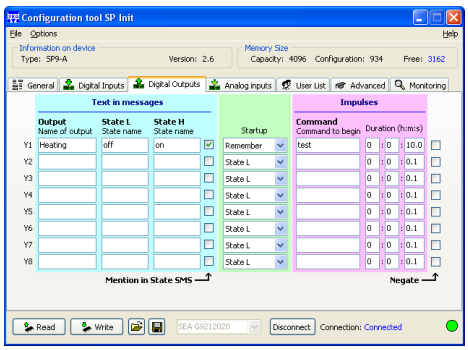
7.3.3 Internal input "PWW" - power

SP9 has an internal digital input PWW (internally X12 input e.g. for MACRO), which monitors the supply voltage. The value "H" means the SP9 is powered from external power supply. The value "L" means SP9 is battery powered. Events and state SMS are configured like for any other digital input.

7.4 SPInit - Tab "Digital Outputs"

On this tab, you can set configuration of all digital outputs of SP9 device. (These outputs have only two states: YES – NO).

These texts will appear in the status SMS.



7.4.1 Text in Messages

Output Name, State L, State H

These fields contain names of outputs and their possible states, which are listed in the status SMS message.

Example:
If you name the *Output* "Output1", *Status L* "Off" and *Status H* "On", than you will see the following text in the status SMS: "`Output1 = Off`".

Mention in State SMS

If this box is checked, the status of this output will appear in the status SMS.

Startup

After power on, the SP9 can set an output to "State L", "State H" or retain the status output that was before power off (option "Remember").

7.4.2 Impulses

Command

The text used in the command SMS for generating of a pulse on the output (e.g. "pulse").

Duration (h: m: s)
Specifies duration of the output pulse.
(Note: the duration timers are nonlinear and it may happen that the program adjusts your choice at the earliest possible time, e.g. 25:0:5 is adjusted to 25:0:0).

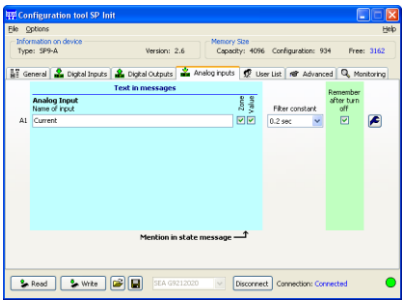
Negate
If this box is checked, the meaning of states L (inactive) and H (active) is opposite.

7.5 SPInit - Tab "Analog Inputs"

On this tab is selected configuration for analog input A1 variant SP9-A.

7.5.1 Text in Messages

Analog Input Name



These fields contain names of inputs and their possible states, which are listed in the status SMS message.

Example:
When we assign *Input* A1 as "Current" and check the "*Zone*" and "*Value*", the part of SMS status message concerning input A1 will look like this "`Current=High 20mA`" for example.

Mention in state message

If this box for Zone and/or Value is checked, the Zone and/or Value of this analog input will appear in the status SMS message.

Filter constant

For each analog input is possible to set by the filter value in range 0.2 sec to 30 sec or without filter.

Remember after turn off

If this box is checked, analog input value and zone state will be remembered before shut down of SP9. After power on of SP9 the actual value and zone is compared with stored value and zone and the SMS message is send or not send depending on the change.

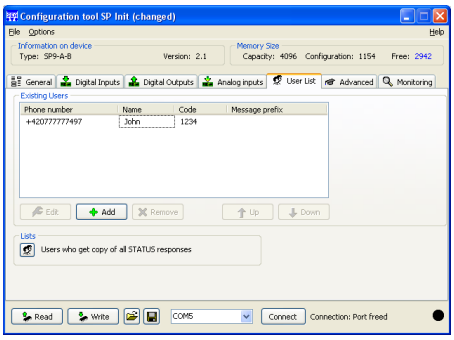
(Actions and settings)

Here is possible to select what SMS messages or calls the SP9 device will send send when the analog inputs status changes (see "Events at the inputs" for details).

7.6 SPInit - Tab "User List"

Device SP6 has one central user list. For any action a user is chosen from this central user list.

7.6.1 Existing users


Configuration tool SP Init (changed)
File Options Help
Information on device
Type: SP9-A-B
Version: 2.1
Memory Size
Capacity: 4096 Configuration: 1154 Free: 2942
General Digital Inputs Digital Outputs Analog inputs User List Advanced Monitoring
Existing Users
Phone number Name Code Message prefix
+420777777497 John 1234
Edit Add Remove Up Down
Lists
Users who get copy of all STATUS responses
Read Write COM5 Connect Connection: Port freed

Phone number
User phone number which is used for sending SMS messages or voice calls for this user.
Attention: Authorization of incoming messages does not depend on the phone number - the phone number is used only for sending SMS (or voice call)!

Name
User name. This area is not used by SP9 device. It is useful for better orientation in list.

Code
User code. This code is used for authorization of incoming command messages. Received SMS are executed only if it contains "code" of some user in your user list.

Message prefix
The text which is added in front of SMS message for this user. It is used for sending messages e.g. at e-mail. This message is usually sent on special phone number (e.g. 4616) and first in message is an e-mail address.

Pulse on Call
The voice call from user's phone number results into pulse on the selected output (Dout1 to Dout8). Select item "-" for no pulse. The pulse duration can be set in the "Digital Outputs" in area Impulses.

7.6.2 Lists

Users who get copy of all STATUS responses

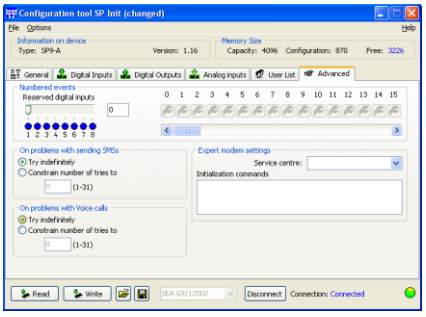
Choose users, to whom the copy of status massage is sent whenever any status message is about to send.

7.7 SPInit - Tab "Advanced"

On this tab are placed special advanced features of the SP9.

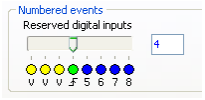
7.7.1 Numbered events

"Numbered events" can activate more events than is the number of inputs. For this special function is possible to select several SP9's input signals.


Configuration tool SP Init (changed)
File Options Help
Information on device
Type: SP9-A
Version: 1.16
Memory Size
Capacity: 4096 Configuration: 870 Free: 3226
General Digital Inputs Digital Outputs Analog inputs User List Advanced
Numbered events
Reserved digital inputs
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
1 2 3 4 5 6 7 8
On problems with sending SMSs
Try indefinitely
Constrain number of tries to
(1-31)
Expert modem settings
Service centre:
Initialization commands
On problems with Voice calls
Try indefinitely
Constrain number of tries to
(1-31)
Read Write Disconnect Connection: Connected

Typical usage is when the error numbers are sent as a code. This decreases the number of signals needed for communication with e. g. PLC. The signals with a code are called "data" signals. When these signals are valid, they are strobe by a signal called "data valid". On a rising edge of this signal, the "data signals" are evaluated and adequate SP9 event is generated.

Any combination of input "data" signal is an independent event which can send SMS and make a voice call (see chap. Events)



Example: If a combination of four inputs 1 1 0 1: means a serious failure it's possible to send following SMS "A serious failure in the city steam plant." to all technical stuff and to the head of the firm too. And then to make a voice call to all technicians to increase probability they will read the SMS.

The input signals for this function are selected beginning by digital input no 1. All other not used digital inputs keep their former function. Maximum 8 (7 data + 1 strobe) digital inputs of SP9 is possible to use for this special function. It means up to 128 (2^7) events can be assigned.

7.7.2 On problems with sending SMS

Specifies how many attempts to send an SMS are made when any problem appears in GSM network. The range is 1 to 31 attempts.

7.7.3 On problems with Voice call

Specifies how many attempts of voice call are made when any problem appears in GSM network. The limit range is 1 to 31 attempts.

7.7.4 Expert modem setting

Service center (SCA)
Leave empty. It is intended for users, who have special Service center.

Initialization commands
Specifies AT commands, which the device sends into the GSM modem at startup. ATTENTION! Commands in this field may cause malfunction of the device. Enter commands only after consultation with the manufacturer of the device!

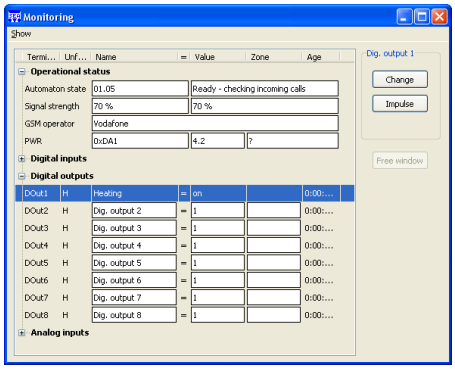
7.7.5 Automatically repeated actions

Action Group A, Action Group B

Allows you to specify the time period after which SP9 executes the specified list of events. This is useful e.g. for automatic reporting that the device is functional and can communicate via GSM network. This feature is called "alive".

7.8 SPInit - Tab "Monitoring"

Program SPInit enables to watch status of inputs and outputs on PC monitor in tab "Monitoring". Monitoring can be local via USB cable or remote via GSM data connection (CSD). It's possible to switch on or off digital outputs by clicking on pushbutton [Change] or [Pulse]. It helps to check function of external circuitry.


Monitoring
Show
Termi... Unf... Name = Value Zone Age
Operational status
Automaton state 01.05 Ready - checking incoming calls
Signal strength 70 % 70 %
GSM operator Vodafone
PWR 0xDA1 4.2 ?
Digital inputs
Digital outputs
DOut1 H Heating = on 0:00:...
DOut2 H Dig. output 2 = 1 0:00:...
DOut3 H Dig. output 3 = 1 0:00:...
DOut4 H Dig. output 4 = 1 0:00:...
DOut5 H Dig. output 5 = 1 0:00:...
DOut6 H Dig. output 6 = 1 0:00:...
DOut7 H Dig. output 7 = 1 0:00:...
DOut8 H Dig. output 8 = 1 0:00:...
Analog inputs
Dig. output 1
Change
Impulse
Free window

7.8.1 Operational status

List of actual information concerning the SP9 device and it's functioning.

Automaton state Information for service purposes only
Signal strength GSM signal level in %
GSM operator Actual GSM operator's name

7.8.2 Digital inputs, outputs and analog inputs

List of actual status of all digital inputs, outputs and analog inputs.

Terminal The terminal name
Unfiltered Measured values of the inputs or outputs of the device are usually filtered to avoid often change of state. In this box you will find the real value of the input device. This is useful especially when the delay is set to a larger transition time, e.g. 1 hour.
Name Name of input or output
Value Analog input value
Zone Analog input zone (e.g. low, high)
Age Input values are not updated immediately. Depending on CPU values may be delayed up to 20 seconds. This field will show when an item has been measured last time.

When any output is selected, it's possible to use the right mouse button to change the status and generate a pulse. This is useful for testing the function of the external circuits connected to SP9. Please be patient after pressing – the change of output may take some time (e.g. 20 seconds when connected via GSM).

7.9 SPInit - Important Terms Explanation

PIN (Personal Identification Number – usually four digits number). Only persons with knowledge of PIN can operate a SIM card (in case the PIN usage on a SIM card was activated). Usage of the PIN can be deactivated. Insert the SIM card to your mobile phone and follow the instruction in the mobile phone manual. (Usually the PIN usage can be deactivated in Menu -> Security -> PIN).

ACCESS CODE = Password for SMS commands, configuration and monitoring of SP9 accepts only SMS with a valid access code. The password is requested also for connection of SP9 (via USB cable or remotely via data connection of GSM network). Factory setting of access code is "1234".

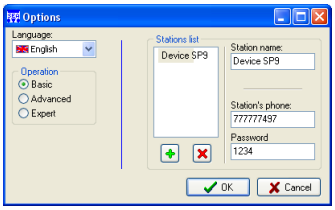
EVENT = level change in case of digital input, zone change in case of analog inputs. SP9 can react on EVENTS by several ACTIONS if it is setup this way. SP9 can send SMS messages on selected phone numbers and/or to make voice calls on selected phone numbers.

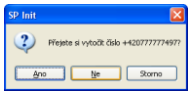
ACTION = one voice call or one SMS to one user. Any EVENT can contain several ACTIONS.

USER LIST = List of all users and their phone numbers which are used for ACTIONS. User names are used only for better clarity. SP9 does not use them in any way.

7.10 Remote Configuration

SP9 can be configured remotely via GSM data connection (CSD) in the same way like via USB cable (Note: You need any GSM modem connected to your PC). Just click in menu [Options] and in new window called "Options" set the "Station's phone" number for data connection to SP9. Click [OK] to close the window. For connection select proper COM port which is used for communication with modem and press the button [Connection]. Confirm the phone number [Yes]. When the GSM connection is established it's possible to operate the SP9 in the same way like via USB. Note: Press [Disconnect] when your task is finished.





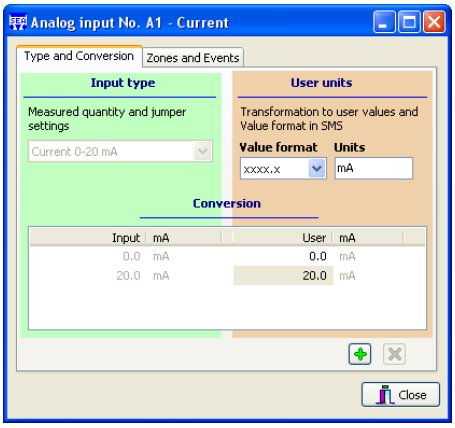
7.11 Events

SP9 can be set up to inform about events (= changes) on its digital and analog inputs. SP9 sends information via SMS message or makes a voice call. By the SPInit program is possible to set several actions for each event specifying the phone number – user who will receive an SMS message and who will be called. A various SMS can be sent to and a voice call can be made to more phone numbers from the list. The order of SMS and voice calls depends on a list of actions for each action. Voice call rises the probability the user will not miss received SMS message.

7.11.1 How to create an Event

First of all the Event has to be created in the configuration program SP Init. Click by a mouse on the symbol of a key . By pushbutton [+ ADD] select requested action of SP9 (SMS or voice call), write the text of SMS which has to be sent or insert the sequence of DTMF numbers in case of a voice call. Now select a user and add him to a list of users for this event by a click on an arrow [>>]. Please check carefully the number of users for an event. In case the number of users is zero nothing will happen (no SMS will be sent).

An event for the analog input can be created in the folder Analog inputs. Click by mouse on the symbol key . In the "Type and conversion" can be set:

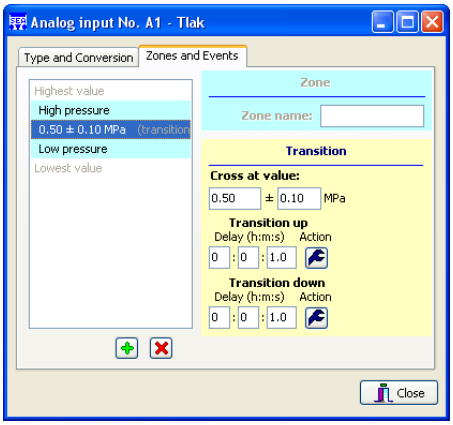


Input type
Note: Analog input A1 (SP9-A) is current type 0-20 mA and cannot be changed.

User units
Here it is possible to select the format of the values (not for internal inputs), which used for displaying and the unit values.

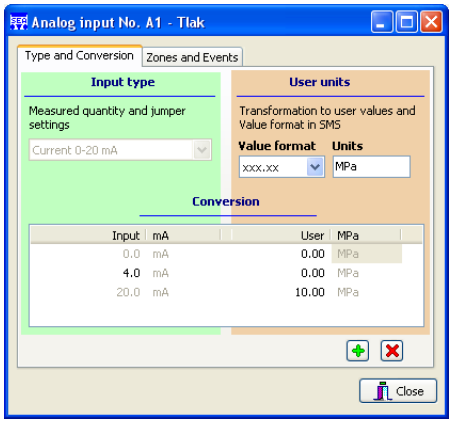
Conversion
In this table, you can specify your own conversion of input values to be displayed (not for internal inputs)

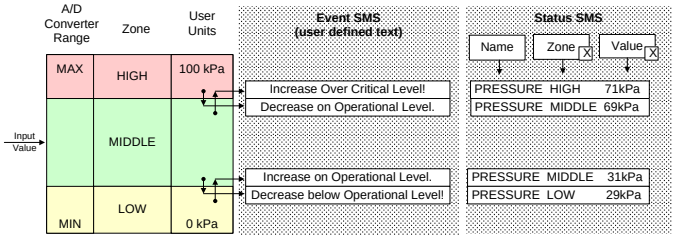
In the tab "Zones and events" can be set the name of the zone and the limit value with hysteresis. Whenever the actual value is inside the zone, the zone name is displayed in the status SMS message. Furthermore is possible to set up the action which will be executed after the input level transition (above or below a certain level) after a specified delay. Setting of actions and macros is the same as for the digital inputs



Example:
Sample configuration with the analog input values conversion to user units:

Analog input is configured as current input 0-20 mA. Pressure sensor gives 4 mA at 0 MPa and 20 mA at 10 MPa (see settings in the picture).





7.11.2 Macros

Macros are useful when you need to get values or input and output states in event or status SMS messages.

Macro	Meaning	Example
[DINx NAME]	Digital input name	Input1
[DINx VALUE]	Digital input state	On
[DOUTx NAME]	Digital output name	Output1
[DOUTx VALUE]	Digital output state	Off
[AIN1 NAME]	Analog input name	Pressure
[AIN1 VALUE]	Analog input value	20
[AIN1 STATE]	Analog input zone	Low
[BAT]	Battery charge level in %	75%
[SIGNAL]	GSM signal level in %	68%
[STATION]	Station name	SP9

Use the following numbers instead of letter "x":
1-11 in Dinx ... as the number of digital input
1-8 at DOutx ... as the number of digital output

Example:

Event SMS prepared in configuration:
Alarm! Details: [DIN1 NAME] = [DIN1 VALUE], [DIN5 NAME] = [DIN5 VALUE], [AIN1 NAME] = [AIN1 VALUE] / [AIN1 STATE], Battery = [BAT] %, Signal = [SIGNAL]

An incoming SMS message:
Office: Alarm! Details: Door = open, Safe = Ok, Pressure = 0.2Pa/Low, Battery = 75%, Signal = 68%

8. Troubleshooting

Problem	Possible reason	Solution
Problems during installation of SP9 **SP9 is not available on GSM network**	No power supply	Check power supply
	Bad or not activated SIM card	Test the SIM card in your mobile phone
	Low credit on prepaid SIM card	Check the credit on prepaid SIM card (contact your operator if necessary)
	Low level of GSM signal	Check the connection of GSM antenna. Check the GSM signal level in the place where is located GSM antenna for SP9 (Use your mobile phone with SIM card from SP9). Signal level has to be at least two bars.
Problems during operation of SP9	Low credit on prepaid SIM card	Check the credit on prepaid SIM card (contact your operator if necessary)
	Prepaid SIM card is no longer valid because credit was not paid for long time. Usually for more than a year.	Test the SIM card in your mobile phone.
	Other reason	Test the SIM card in your mobile phone. (Sending, receiving SMS, voice call, data call). Contact your GSM (mobile phone) operator if you have any problem with SIM card in your mobile phone. Make a small video of LED diode blinking on SP9 and send it to service.
SP9 has problem with SMS sending		Check the SCA center setting on SIM card and in SP9 configuration – program SPInit
Problem with remote configuration via GSM modem	SIM card has not active CSD (Circuit Switched Data) data	Contact your mobile operator to be sure CSD data tariff is active for both SIM cards (in SP9 and in Modem). Note CSD data is not GPRS!

Warning

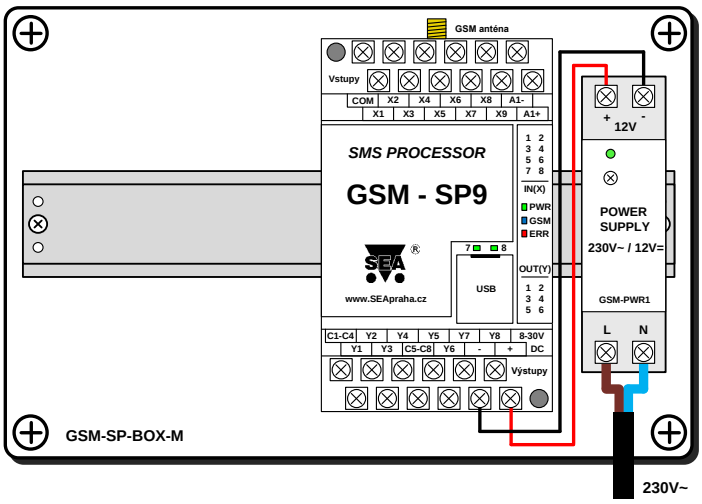
Don't locate GSM antenna too close to SP9 analog inputs due to possible noise interference.

9. Frequently Asked Questions

1. What is necessary to use SP9 successfully?
   - SIM card capable to send and receive SMS messages from standard mobile phone and voice / data call incoming and outgoing as well. Please test all these functions in your mobile phone. It's important to solve all possible problems before using SIM card in SP9. Contact your mobile operator if necessary.
   - Good quality GSM signal in area of installation of SP9 (at least 2 bars on your mobile phone). If there is a problem with GSM signal quality, try to use another type of external antenna, which can be placed in proper place with better GSM signal and which is connected to SP9 with several meters long coax cable with SMA connector.
   - Sufficient Credit (in case of prepaid SIM card)
   - Cancel all phone calls redirection for a SIM card in SP9
2. What is a phone number of SCA (SCA = Service Center Address) of my mobile operator? (It's not possible to send an SMS)
   - Contact your mobile operator for this piece of information.
3. I've tested SP9 with my own SIM card. Now I cannot find SMS messages formerly stored on my SIM card.
   - SMS from your SIM card were processed by SP9 and then deleted. They were very probably canceled due to syntactical error.
4. Where can I find more (and up to date) information?
   - Search GSM-SP9 product on the website www.seapraha.cz English pages

10. SP9 in box

Special box for SP9 (order code GSM-SP-BOX-M) with power supply (type GSM-PWR1) is produced. Note: This box has to be ordered separately.



Box parameters:
Width: 166 mm
Height: 140 mm (without connectors)
Depth: 87 mm
IP55

11. Warranty

General warranty period is 12 months after purchase, when eventual malfunction device will be repaired free of charge in SEA company while shipping to SEA is paid by customer and SEA pays for shipping back to customer. For SW there is 24 months warranty under following conditions:
Both CPU and PC software is sold "as is". The software was created by the best software engineers in SEA and was carefully tested both in SEA and also by SEA customers using GSM applications products made in SEA. In spite of making all possible to get error free software it can happen, that the software in CPU or PC programming SW or their mutual interaction has some error under some specific conditions. If such error is found and the description of the problem including configuration file is sent by E-mail to SEA ltd., the error is removed free of charge and SEA will send new SW by E-mail to customer.

SEA ltd. has NO RESPONSIBILITY for any damage, lost, costs and any other problems direct or inducted, caused by such SW error, by eventual device malfunction from any reason or by undelivered SMS from the device.

(Version 1.09-en; 2012-09-05)